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"Histopthological Spectrum Of Leprosy In A Tertiary Care Centre"

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Abstract
Background*: Leprosy affects skin and peripheral nerves, muscles, eyes, bones, testis and internal organs. Histopathology and demonstration of lepra bacilli is a vital role to supplement clinical examination and diagnosis for correct classification and therefore for patients treatment.*
Aim*- To study the Histopathology spectrum of Leprosy in a tertiary care centre.*
Materials &Methods: *All the skin biopsy with clinically suscipious of leprosy and sent for histopathological examination during the year Jan 2020 to Dec 2024 were included in the study.*
Results: *A total of 60 cases were studied out of them 61% are male and 39% are female. With M:F ratio1.56: 1, majority of them belongs to 41-50 age group. The commonest histological type was borderline TB leprosy followed by Borderline lepromatous leprosy, least common cases were of lepromatous leprosy and histoid leprosy.*
Conclusion: *Histopathological examination is the important investigation for accurate diagnosing and typing of leprosy.*
Keywords: *Borderline tuberculoid leprosy, Skin Biopsy, Leprosy, Histopathology.*

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I. Introduction:

Leprosy Or Hansens disease, is a slowly progressive infection caused by M.leprae that mainly affects skin and peripheral nerves.Leprosy affects cooler part of the body mainly skin and peripheral nerves ,also involves bones, internal organs, testis, eyes, muscles 1. Leprosy is also known as Hansen s disease as its causative agent Mycobacterium leprae discovered by Armauer Hansen s in 1873.Even though it was discovered early ,it has not been cultured yet.

The source of infection and route of transmission are not known, however human respiratory secretions or soil are likely origins. M. Lepra is taken up by macrophages and disseminates in the blood, but it replicates primarily in relatively cooler tissue of the skin and extremities. It proliferates best at 32 to 34 degree Celsius,the temperature of human skin. page. Leprosy may transmitted via aerosols containing M .leprae(droplet infection) .It may also transmitted from person to person by close contact between an infectious patient and a healthy but susceptible person. Leprosy has a long incubation period , on an average of 3 to 5 years or more.

Leprosy has been declared eradicated in 2005 ,though it is as an important public health problem in our country on **4**.Although it is more prevalent in many areas in INDIA carrying a social stigma for patients and causing profound disability/deformity **9 ,10.** Leprosy mainly affects the skin ,causing lesions and aesthesia,along with thickened peripheral nerves **10**.

Histopathological typing of leprosy cases was laid down by Ridley and Jopling classification in 1966 ,according to their position on an immune histological scale 12.Our aim of present study was histological diagnosis of leprosy and to classify the disease into Tuberculoid Leprosy (TT),Borderline tuberculoid(BT), Midborderline (BB) ,Borderline lepromatous(BL),and lepromatous leprosy(LL) . Indetermined forms include a type that does not fit into any of five categories. Histoid leprosy is an uncommon type of LL that shows nodules or plaques over apparently normal skin. It adds valuable aid to reach confirmatory diagnosis and its subtypes ,prognosis ,an assessement or regression of the disease in patient under treatment and also for research purpose . M.leprae causes two strinkingly different patterns of disease, called tuberculoid and lepromatous ,that are determined by the helper T lymphocyte response to M.leprae.

Tuberculoid leprosy begins with the localized flat, red skin lesions that enlarge and develop, with irregular shapes with indurated elevated ,hyperpigmented margins and depressed pale centres. Nerves become enclosed within granulomatous inflammatory reaction and if small are destroyed .Nerve degeneration causes skin anesthesia and skin and muscle atrophy that render the person liable to trauma of the affected parts ,leading to

development of chronic skin ulcers. Contractures ,paralyses and autoamputation of fingers or toes may ensue .Because of the host defense ,tuberculoid bacilli are almost never found, hence the name paucibacillary leprosy.

Lepromatous leprosy involves skin and peripheral nerves, anterior eye chamber, upper airways, testes, hand and feet. Lepromatous lesions contain large aggregates of lipid laden macrophages (lepra bacilli) often filled with the masses (globi)of acid fast bacilli. Because of the abundant bacteria , lepromatous leprosy referred to as Multibacillary. Macular, papular or nodular lesions form on the face, ears, wrists, elbows, and knees. With progression , the nodular lesions coalesce to yield a distinctive leonine facies. Most skin lesions are hypoesthetic or anesthetic. The peripheral nerves, particularly the ulnar and peroneal nerves where they approach the skin surface, are symmetrically invaded with mycobacteria. The Testes are usually extensively involved , leading to destruction of the seminiferous tubules and consequent sterility.

Histopathological diagnosis depend upon the demonstration of type of granuloma ,giant cells, the intensity of lymphocyte involving various zones of skin and macrophages. Histopathological diagnosis of tuberculoid type mainly depends on epitheloid cells, ,Langerhans giant cells and lymphocytes . On Histopathology we found epidermal changes in the form of thinning and atrophy followed by normal epidermis and ulcerative changes . Tuberculoid cases shows perineural infiltration and well formed to ill formed granulomas. Epitheloid cell granuloma and giant cells were more common in tuberculoid pole whereas foamy macrophages with clear subepidermal grenz zone more common in lepromatous pole. Section of Histoid leprosy shows the presence of macrophage activation and the cells become spindle shaped and oriented in a storiform pattern. This article aims to study the various histological types of leprosy in a tertiary care hospital over a period of 4 years.

II. Aim-

The aim is to study Histopathological spectrum of Leprosy cases in a tertiary care centre.

III. Material & Methods-

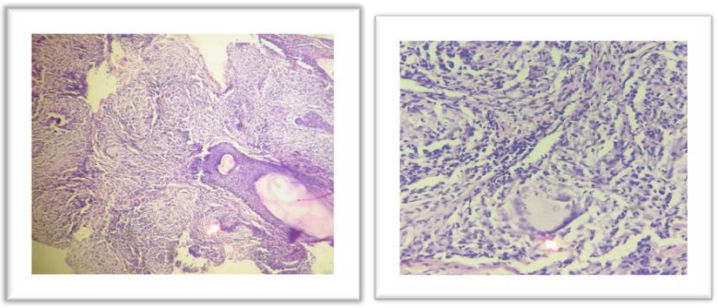
Clinically suspected patients of leprosy in the department of skin in a tertiary care centre .Both newly suspected and relapse cases were included in the study after taking written consent. This was a study of skin biopsies of 60 leprosy patients received over a period of 4 years. Clinically suspicious patients of leprosy of all age groups and both the sex were included. Inadequate skin biopsies, poorly preserved biopsy was excluded from the study. Adequate skin Biopsies were taken by dermatologist and sent to histopathology section in 10% formalin solution along proforma including the detailed clinical history and examination of patients along with provisional diagnosis were collected. Gross examination was done as per appearance and size. After gross examination, biopsies were fixed by 10% formalin and processed preferably within 24 hours. After fixation, the tissues were processed, embedded in paraffin and serial sections were obtained and stained with Hematoxylin and Eosin stain to assess the morphology under the microscopy. Cases of leprosy were classified according to Ridley Jopling histopathological classification into Tuberculoid leprosy, Borderline Tuberculoid leprosy, Borderline Lepromatous leprosy, lepromatous leprosy .Cases of Histoid leprosy- a rare variant were also reported in the present study.

Inclusion criteria -All cases clinically suspected as leprosy.

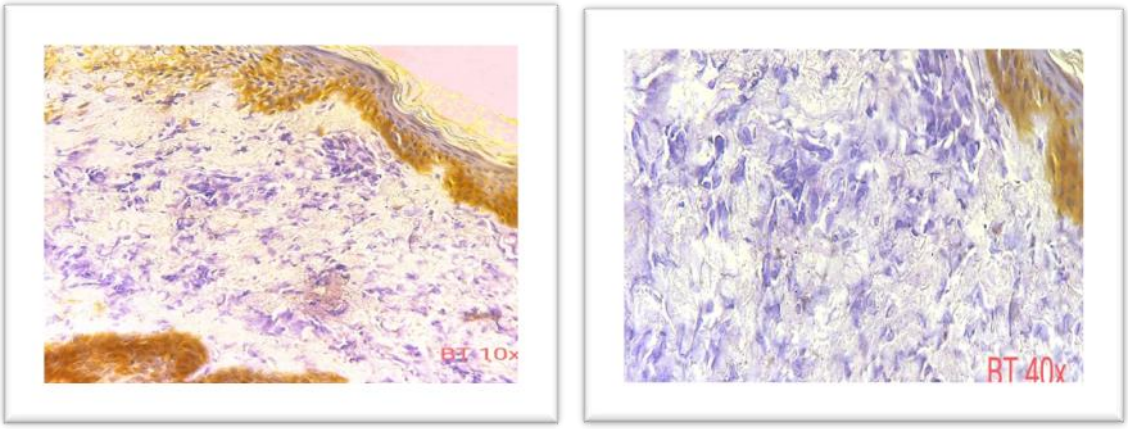
Exclusion criteria-Patients having inadequate skin biopsies , poorly preserved skin biopsies or incomplete history on requisition forms.

IV. Observation And Results-

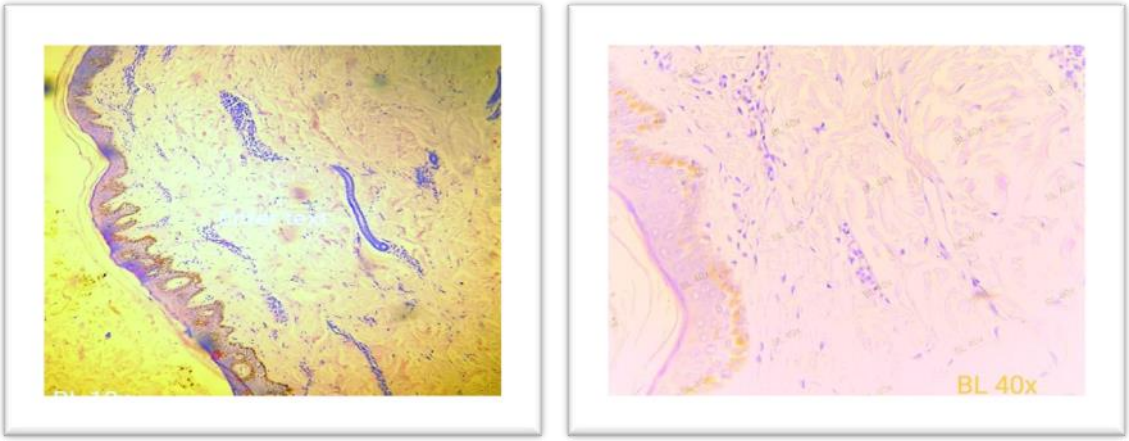
The present study included 60 skin biopsies, received from the patients who were clinically suspected as leprosy from January 2020 to December 2023. Our study included 0-80 year age groups. All biopsies were classified as per Ridley and Jopling histopathological classification.



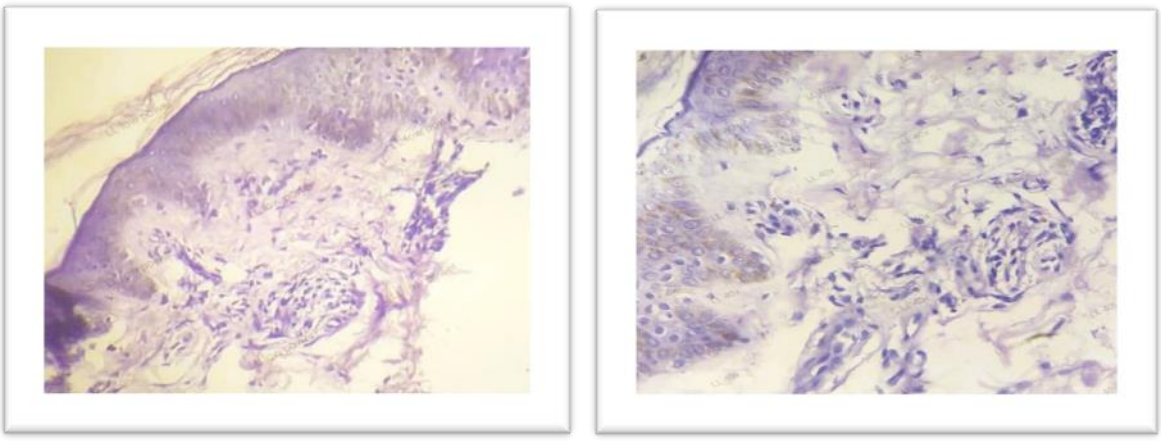
Above image of Tuberculoid tuberculoid leprosy shows well formed to ill formed granuloma along with langhans giant cell in the dermis.



Above image showing ,Borderline tuberculoid leprosy with ill defined granuloma under the skin.



Above image of Borderline lepromatous leprosy shows Epidermis. The dermis shows clusters of lymphocytes and histiocytic infiltration.



Above image of lepromatous leprosy showing skin.Underneath shows groups of foamy histiocytes in the dermis.

The Present study shows Male predominance (37 cases, 61.66%) as compared to female (23 cases ,38.33%) with a male to female ratio of 1.56:1. Among the 60 cases ,27 cases diagnosed as borderline tuberculoid

followed by 16 cases of borderline lepromatous ,8 cases of tuberculoid leprosy,5 cases of lepromatous leprosy,2 cases of histoid leprosy and 2 cases of lepra reaction.

Table: No 1 Shows The Distribution Of Patients According To Diagnosis

Diagnosis	No of cases	Percentage
Borderline tuberculoid leprosy	27	45.00%
Lepromatous leprosy	5	8.33%
Tuberculoid leprosy	8	13.33%
Histoid leprosy	2	3.33%
Borderline lepromatous leprosy	16	26.66%
Lepra reaction	2	3.33%
TOTAL	**60**	**100.00%**

As shown in Table No 1 , the common diagnosis found on histopathology was borderline tuberculoid seen in 45.00% of the study subjects followed by borderline lepromatous leprosy cases seen in 26.66% of study subjects and tuberculoid leprosy cases seen in of the 13.33% subjects . Lepromatous leprosy cases were 8.33% ,histoid leprosy and lepra reaction were found in 3.33% of the study.

Table No 2 Age Wise Distribution Of Leprosy Cases

AGE(YEARS)	NO OF CASES	PERCENTAGE
0-10	2	3.33 %
11-20	8	13.33 %
21-30	7	11.66 %
31-40	13	21.60 %
41-50	14	23.33 %
51-60	12	20 %
61-70	2	3.33 %
71-80	2	3.33 %
	60	**100%**

The age distribution of patients varied between 0-80 year age groups with peak among 30-60 year. Maximum no of cases was seen in the age group 41-50 year(14 cases, 23.33%) followed by 31-40 year (13 cases,21.66%) and 51-60 year age group (12 cases,20%) .Less no of cases were found in the age groups 11-20 year (8 cases,13.33%),0-10 year age group (2 cases,3.33%), 61-70 year age group (2 cases,3.33%),71-80 year age group (2 cases,3.33%). The most common age in our study was found to be in the age group of 41-50 years, followed by 31-40 years and 51-60 years.

Table No 3 Sex Wise Distribution Of Leprosy Cases

SEX	NO OF CASES	PERCENTAGE
MALE	37	61.66%
FEMALE	23	38.33%
TOTAL	60	100.00%

As shown above Male patients are 61.66% which were more than female patients i.e. 38.33%

V. Discussion-

Leprosy occurs in all age groups ranging from early infancy to old age. To stop new infection and prevention of disability, accurate diagnosis and complete treatment of leprosy is necessary. In the present study, Ridley Jopling histopathological classification was used to classify leprosy cases.

Present study shows Male predominance over the Female with Male cases being 61.66% , which is in concordance with Vahini et al, Veena et al, Shivani soni et al, Perona roy et al, Shindu shree et al showing male predominance with 72.5%, 82%, 60.97%, 68.97%, 82%.

The most common lesion in the present study was Borderline Tuberculoid Leprosy type with 27 cases which was in concordance with Shivaswamy et al, Senori et al.,Murthy et al., Ashok kumar et al , chintal et al and Anisha et al.

An immunological instability is seen in the borderline cases ,which with treatment move towards the tuberculoid pole and without treatment towards the lepromatous pole.

Increased awarness of the people due to many national programmes makes them to present them at an earlier stage to clinicians ,which may contribute to increased no of borderline leprosy.

Clinically patients are classified into multibacillary and paucibacillary which determines the duration of their treatment .Misclassification leads to increased risk of relapse.

In the present study , we found 41-50 year age group is the most commonly affected age group, although other studies found it in a younger age group.

VI. Conclusion-

Leprosy though considered to be eliminated from INDIA .It is still prevalent in many areas and causing profound disability /deformities.For eradication of disease ,there is still the necessary to study and research for better understanding of the disease. Histopathological examination of skin lesion should be done in all leprosy cases as clinical diagnosis of early leprosy is quite difficult. Males were more commonly affected than females with a maximum no of cases in 41-50 year age group. The most common lesion in the present study was Borderline tuberculoid Leprosy. Exact clinically typing of Leprosy is not possible, hence Histopathological examination is the important investigation for accurate diagnosing and typing of leprosy cases.

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